

# **REMARKS**

The Examiner's continued attention to the application is noted with appreciation.

## **Claim Rejections Under 35 USC § 112**

The Examiner rejected claims 1, 3-8 and 10-17 under 35 USC § 112 ¶ 1, as failing to comply with the written description requirement, and stated that the claims contain subject matter which was not described in the specification to show possession of the claimed invention. The Examiner further stated that the limitation that the layers in combination "maximize the liberation of a gaseous reaction product" is not described in the specification or the claims as originally filed. Applicant has amended independent claim 1 to recite: "An energy dense energetic material comprising: a layer of material comprising one or more metals substantially not in oxide form, comprising one or more compositions selected from the group consisting of metal hydrides and metals with interstitial hydrogen; and a layer of material comprising one or more metals substantially in oxide form; and wherein said layers in combination are energetic, reduce diffusion flux, and liberate a gaseous reaction product, and have a thickness of less than or equal to approximately 10 nm; and wherein energetic fragments forming upon detonation comprise a material selected from the group consisting of elemental Mn and elemental P." Therefore, independent claim 1 as amended are definite and do not claim new matter. Claims 3 through 8 and claims 10 through 17 depend on claim 1. Accordingly, Claims 1, 3-8 and 10-17 are now in condition for allowance.

## **Claim Rejections Under 35 USC § 102(b) and § 103(a)**

The Examiner rejected claims 1, 3-4, 6-7, 10, 12-13, 15 and 17 under 35 USC § 102(b) as anticipated by, or in the alternative, under 35 USC § 103(a) as being obvious over Danen et al. (U.S. Patent No. 5,266,132). The Examiner stated that Danen teaches an energetic material

energetic material wherein layers A and B have thicknesses between 1 and 1,000 nm (Col. 2, lines 1-5). Applicant has amended independent claim 1 to include allowable subject matter noted by examiner on page 7 of the Office Action. Thus claim 18 includes the allowable subject matter cited by the Examiner on page 7.

*Claim Rejections Under 35 USC §103(a)*

The Examiner rejected claims 5, 8, 11, 14, and 18-21 under 35 USC § 103(a) as being obvious over Danen et al. (U.S. Patent No. 5,266,132). Applicant has amended claim 1 to include allowable subject matter noted by examiner on page 7 of the Office Action. Because claims 5, 8, 11, and 14 depend on amended claim 1, Applicant believes that claims 1, 5, 8, 11, and 14 are now in condition for allowance.

The Examiner stated that, regarding claims 18-19 and 21, it would have been obvious to one of ordinary skill in the art to have formed a material wherein a first layer of metal hydride is deposited/disposed next to at least one of a second layer of material in oxide form. Applicant has amended claim 18 to recite: "An energy dense energetic material comprising: a first layer of material, comprising one or more compositions selected from the group consisting of metal hydrides and metals with interstitial hydrogen; a second layer of material, comprising one or more metals substantially in oxide form; and wherein said first layer is disposed next to at least one said second layer and said first and second layers in combination are energetic and have a thickness of less than or equal to approximately 10 nm; and wherein energetic fragments forming upon detonation comprise a material selected from the group consisting of elemental Mn and elemental P." Thus claim 18 includes the allowable subject matter cited by the Examiner on page 7.

Applicant has also amended claim 21 to recite: "A method of making an energy dense energetic material, the method comprising the steps of: depositing a layer of material comprising one or more metals substantially not in oxide form, comprising one or more compositions

selected from the group consisting of metal hydrides and metals with interstitial hydrogen; and depositing an adjacent layer of material comprising one or more metals substantially in oxide form; and wherein said layers in combination are energetic, reduce diffusion flux, and liberate a gaseous reaction product, and have a thickness of less than or equal to approximately 10 nm; and form energetic fragments upon detonation comprising a material selected from the group consisting of elemental Mn and elemental P." Thus claim 21 includes the allowable subject matter cited by the Examiner on page 7. Claim 19 depends on claim 18. Accordingly, claims 18-19 and 21 are now in condition for allowance.

An earnest attempt has been made to respond to each and every ground of rejection advanced by the Examiner. However, should the Examiner have any queries, suggestions or comments relating to a speedy disposition of the application, the Examiner is invited to call the undersigned.

Allowance is respectfully requested.

Respectfully submitted,

By: 

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